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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,431	09/21/2001	Timothy R. Hansen	P-5055D1	6518

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Becton, Dickinson and Company
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Franklin Lakes, NJ 07417

EXAMINER

LUDLOW, JAN M

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,431

Applicant(s)

HANSEN ET AL.

Examiner

Jan M. Ludlow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 6, 2004 has been entered.
2. Claims 12-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as filed does not provide support for "direct" binding of the nucleic acids to the magnetic or magnetizable particle in that the term "direct" is not applied to the binding and the disclosure indicates that:

3. For purposes of this description, the term "magnetically responsive particles" refers to iron oxide particles, magnetic particles, ferromagnetic particles, paramagnetic particles particles [sic], any of these types of particles that have been coated with a polymer coating, any particle described in U.S. Patent No. 5,973,138, or any particle that is responsive to a magnetic field. [0037]
4. In that, for example, a paramagnetic particle coated with a nucleic acid fragment is still a paramagnetic particle, and a nucleic acid binding to that particle via the surface coating is still directly bound to the coated particle, which is still a paramagnetic particle, and a coated particle is specifically envisioned by the instant disclosure, it is not clear what applicant means by "direct" binding in that this term has not been defined in the specification, and the teaching of the specification encompasses what applicant is now calling "not direct" binding, whereas the

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specification makes no such distinction. Note further that the incorporated reference to Collis does not use the term "direct" binding. The addition of the term "direct" is therefore new matter.

5. The amendment filed August 6, 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "Direct" binding is not described in the specification as filed.

6. Applicant is required to cancel the new matter in the reply to this Office Action.

7. Claims 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. It is not clear what is intended by the term "directly" in that it has not been used in the specification as filed. Note that the instant particles are broadly defined, and therefore the examiner has interpreted the particles broadly in view of the instant specification and prior art as encompassing particles having non-magnetic materials incorporated therein or coated thereon (the latter being specifically disclosed herein), and therefore interpreted direct binding as including direct binding to the coating or non-magnetic material that may be present.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

10. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

12. Determining the scope and contents of the prior art.
13. Ascertaining the differences between the prior art and the claims at issue.
14. Resolving the level of ordinary skill in the pertinent art.
15. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 12-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howe et al (5458785) in view of Benner (4638032) and/or Tepic (5591448).

18. Howe teaches a method of processing magnetic particles. The particles may have DNA bound to them (col. 4, lines 26-50, esp. lines 27-28, 38, 45-50 and col. 6, line 52). The beads may be paramagnetic (col. 4, line 52). Tubes 6, 7 are received in openings in plate 5, pairs of magnets 3 pull the beads to the tube sides, fluid is removed, fresh fluid added, the magnet is moved axially (Fig. 4A) to a position free of the tube and the beads resuspended (see, e.g., claim 2; col. 5, lines 35-45; col. 6, lines 40-50; bridge cols. 6-7).

19. Howe fails to teach applying a magnetic field to demagnetize the particles.

20. Benner teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 17, lines 1-5).

21. Tepic teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 5, lines 40-45, col. 7, lines 1-6).

22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a magnetic field to the particles of Howe in order to demagnetize them to prevent aggregation and assist in resuspension as taught by Benner and/or Tepic. With respect to the application of an AC magnetic field, Tepic teaches an alternating field. With respect to positioning of the application of the demagnetizing field, absent a showing of criticality, it would have been obvious to locate the demagnetizing field at any suitable location proximal to the tube in order to perform the demagnetizing function. With respect to the cam, absent a showing of criticality, it would have been obvious to use any known mechanical expedient for moving the magnetic plate for its known function.

23. Claims 12-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collis (5973138) in view of Howe et al (5458785) in view of Benner (4638032) and/or Tepic (5591448).

24. Collis teaches a method of isolating nucleic acids by direct binding to magnetizable particles, attracting the particles to the side of the tube, washing the particles and repeating (col. 5, lines 30-45).

25. Collis fails to teach the separation performed in the apparatus claimed by the steps claimed.

26. Howe teaches a method of processing magnetic particles. The particles may have DNA bound to them (col. 4, lines 26-50, esp. lines 27-28, 38, 45-50 and col. 6, line 52). The beads may be paramagnetic (col. 4, line 52). Tubes 6, 7 are received in openings in plate 5, pairs of magnets 3 pull the beads to the tube sides, fluid is removed, fresh fluid added, the magnet is moved axially (Fig. 4A) to a position free of the tube and the beads resuspended (see, e.g., claim 2; col. 5, lines 35-45; col. 6, lines 40-50; bridge cols. 6-7).

27. Howe fails to teach applying a magnetic field to demagnetize the particles.

28. Benner teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 17, lines 1-5).

29. Tepic teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 5, lines 40-45, col. 7, lines 1-6).

30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the particles of Collis in the apparatus of Howe in order to use a known arrangement for executing the steps taught by Collis using the device of Howe. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a magnetic field to the particles in order to demagnetize them to prevent aggregation and assist in resuspension as taught by Benner and/or Tepic. With respect to the application of an AC magnetic field, Tepic teaches an alternating field. With respect to positioning of the application of the demagnetizing field, absent a showing of criticality, it would have been obvious to locate the demagnetizing field at any suitable location proximal to the tube in order to perform the demagnetizing function. With respect to the cam, absent a showing of criticality, it would have

been obvious to use any known mechanical expedient for moving the magnetic plate for its known function.

31. Claims 12-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (6027945) in view of Howe et al (5458785) in view of Benner (4638032) and/or Tepic (5591448).

32. Smith teaches a method of isolating nucleic acids by direct binding to magnetizable particles, such as particles having ferromagnetic material incorporated into a silica gel matrix (col. 6, lines 39-40) and separating the bound nucleic acids magnetically using commercial apparatus (col. 7, lines 18-26).

33. Smith fails to teach the separation performed in the apparatus claimed by the steps claimed.

34. Howe teaches a method of processing magnetic particles. The particles may have DNA bound to them (col. 4, lines 26-50, esp. lines 27-28, 38, 45-50 and col. 6, line 52). The beads may be paramagnetic (col. 4, line 52). Tubes 6, 7 are received in openings in plate 5, pairs of magnets 3 pull the beads to the tube sides, fluid is removed, fresh fluid added, the magnet is moved axially (Fig. 4A) to a position free of the tube and the beads resuspended (see, e.g., claim 2; col. 5, lines 35-45; col. 6, lines 40-50; bridge cols. 6-7).

35. Howe fails to teach applying a magnetic field to demagnetize the particles.

36. Benner teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 17, lines 1-5).

37. Tepic teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 5, lines 40-45, col. 7, lines 1-6).

38. It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the particles of Smith in the apparatus of Howe in order to use a known arrangement for executing the steps taught by Smith using the device of Howe. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a magnetic field to the particles in order to demagnetize them to prevent aggregation and assist in resuspension as taught by Benner and/or Tepic. With respect to the application of an AC magnetic field, Tepic teaches an alternating field. With respect to positioning of the application of the demagnetizing field, absent a showing of criticality, it would have been obvious to locate the demagnetizing field at any suitable location proximal to the tube in order to perform the demagnetizing function. With respect to the cam, absent a showing of criticality, it would have been obvious to use any known mechanical expedient for moving the magnetic plate for its known function.

39. Claims 12-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breivik (6090935) in view of Howe et al (5458785) in view of Benner (4638032) and/or Tepic (5591448).

40. Breivik teaches a method of isolating nucleic acids by direct binding to magnetic particles and magnetic separation (col. 4, lines 5-28 and Example 2).

41. Breivik fails to teach the separation performed in the apparatus claimed by the steps claimed.

42. Howe teaches a method of processing magnetic particles. The particles may have DNA bound to them (col. 4, lines 26-50, esp. lines 27-28, 38, 45-50 and col. 6, line 52). The beads may be paramagnetic (col. 4, line 52). Tubes 6, 7 are received in openings in plate 5, pairs of

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magnets 3 pull the beads to the tube sides, fluid is removed, fresh fluid added, the magnet is moved axially (Fig. 4A) to a position free of the tube and the beads resuspended (see, e.g., claim 2; col. 5, lines 35-45; col. 6, lines 40-50; bridge cols. 6-7).

43. Howe fails to teach applying a magnetic field to demagnetize the particles.

44. Benner teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 17, lines 1-5).

45. Tepic teaches demagnetizing particles in order to prevent aggregation and permit resuspension (col. 5, lines 40-45, col. 7, lines 1-6).

46. It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the particles of Breivik in the apparatus of Howe in order to use a known arrangement for executing the steps taught by Breivik using the device of Howe. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a magnetic field to the particles in order to demagnetize them to prevent aggregation and assist in resuspension as taught by Benner and/or Tepic. With respect to the application of an AC magnetic field, Tepic teaches an alternating field. With respect to positioning of the application of the demagnetizing field, absent a showing of criticality, it would have been obvious to locate the demagnetizing field at any suitable location proximal to the tube in order to perform the demagnetizing function. With respect to the cam, absent a showing of criticality, it would have been obvious to use any known mechanical expedient for moving the magnetic plate for its known function.

47. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Howe and Benner and/or Tepic; Collis in view of Howe and Benner and/or Tepic; Smith in view of Howe

and Benner and/or Tepic; or Breivik in view of Howe and Benner and/or Tepic as applied to claims 16-20, 22-28 above, and further in view of Beinhaus (6117398).

48. Howe fails to teach temperature control.

49. Beinhaus teaches a method of isolating nucleic acids using magnetic particles with heating and cooling.

50. It would have been obvious to heat and/or cool the tubes of Howe in order to enhance DNA separation as taught by Beinhaus.

51. Applicant's arguments filed August 6, 2004 have been fully considered but they are not persuasive.

52. Applicant argues that Howe does not teach nucleic acids bound directly to the particles, but the term "direct" binding has not been described in the specification to an extent that the term can be interpreted. Howe teaches that the polymer is bound to the beads (col. 4, line 29) and that the polymer may be a nucleic acid (col. 4, lines 39-49). Note that in the instant application, the beads may also be coated with a polymer (of unspecified properties) prior to binding the nucleic acid (e.g., p. 7, paragraph [0037]), analogous to the coating that applicant argues is between the bead and the nucleic acid, resulting in what applicant is now calling "indirect" binding. It is the examiner's position that because the definition within the instant specification of "magnetically responsive particle" is so broad, Howe does teach direct binding to the bead, wherein the bead comprises a magnetic core and a polymer coating. Note that the claims do not require, nor does the specification describe, direct binding to the magnetic material within the particle, but rather binding to the particle as a whole, including coated particles. Note further that neither the claims

nor the specification preclude non-magnetic materials being present in the particles, and the specification specifically contemplates a polymeric coating.

53. Similarly, applicant argues that Smith does not teach direct binding to the particle, but the text cited by applicant teaches “particles **containing**...amounts of a nucleic acid binding material” (col. 4, lines 43-44) and specifically describes binding to exemplified particles as “direct” (e.g., col. 4, line 47, line 65 and elsewhere). Smith teaches both a silica-coated particle, and a silica magnetic particle having ferromagnetic material **incorporated** into a silica gel matrix (col. 6, lines 39-40). Both particles fall within the instant definition of “magnetically responsive particle” and the nucleic acids bind directly to the particles, albeit to the non-magnetic portion of the particle.

54. With respect to Breivik, the portion of the text cited by applicant (col. 4, lines 5-24) refers to some commercially available beads, but does not describe their properties, and therefore does nothing to overcome the rejection. Breivik teaches that attachment of probes to the beads is optional (col. 7, lines 15-20) and that the magnetic particles alone work well in the claimed method despite previous studies showing low non-specific binding of DNA and/or RNA (col. 4, lines 25-28).

55. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jan M. Ludlow whose telephone number is (571) 272-1260. The examiner can normally be reached on Monday-Thursday, 11:30 am - 8:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jan M. Ludlow
Primary Examiner
Art Unit 1743

Jml
September 30, 2004